

## **REMARKS**

### **I. Status of the Application**

Claims 25-27, 29-38, 40-43, and 47-53 are pending in the application. Claims 1-24, 28, 39, and 44-46 have been previously cancelled without prejudice to the filing of any appropriate continuation applications. Claim 53 is a new claim.

Claims 25, 27, 29, 32-37, 40, 47-48, and 50-52 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky et al. US 4,141,783 in view of Badertscher GB 2,036,534 and further in view of Fabre US 4,689,237.

Claim 49 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Den Hollander US 5,558,819.

Claims 26, 30, and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Rubens EP 0 438 783.

Claims 38 and 41 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claims 37 and 40, and further in view of Passey US 3,564,723.

Claim 42 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher, Fabre, and Passey as applied to claim 41, and further in view of Hovmand US 4,062,641.

Claim 43 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Johnston US 2,401,077.

New claim 53 has been added to the application. Claim 53 depends from claim 25 and further recites “wherein the steam is introduced into the mixing chamber using a spray nozzle.” Support for new claim 53 is found in claim 12 of the originally filed application.

## **II. The Pending Claims Are Non-Obvious over the Cited Art**

At page 2, section 3 of the instant Office Action, claims 25, 27, 29, 32-37, 40, 47-48, and 50-52 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and further in view of Fabre. At page 7, section 4 of the instant Office Action, claim 49 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Den Hollander. At page 8, section 5 of the instant Office Action, claims 26, 30 and 31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Rubens. At page 9, section 6 of the instant Office Action, claims 38 and 41 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claims 37 and 40, and further in view of Passey. At page 10, section 7 of the instant Office Action, claim 42 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher, Fabre, and Passey as applied to claim 41, and further in view of Hovmand. At page 10, section 8 of the instant Office Action, claim 43 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Pisecky in view of Badertscher and Fabre as applied to claim 25, and further in view of Johnston. Applicant respectfully traverses these rejections.

**A. The Combination of Pisecky, Badertscher, and Fabre Fails to Render the Claimed Invention Obvious.**

In the present office action, the Examiner has rejected the claims relying upon the description in Pisecky at col. 8 lines 30-33 and lines 39-41, the compartments 104 and 105 of Figure 2, and col. 8 lines 42-63 to support the conclusion that “milk is substantially atomized upon being admixed with steam in the mixing chamber 104.” Applicant respectfully submits that the Examiner’s conclusion of atomization within compartment 104 is not supported by the factual evidence of record. To support the conclusion of atomization, the Examiner considers supply compartment 104 a “mixing chamber.” This, however, is contrary to what Pisecky expressly discloses. Pisecky does not disclose any substantial mixing of liquid milk and steam in compartment 104. In fact the liquid milk and steam exit compartment 104 through different apertures. As Pisecky discloses, upon entering compartment 104 an annular jet of steam *envelopes* the space in compartment 104 that receives the liquid milk so that degasification and steam generation takes place from the liquid. Contrary to admixing the steam and the liquid as required by claim 25, Pisecky discloses that the degassed liquid milk separately exits compartment 104 through ejection aperture 106, while the flow of steam which has absorbed gas and vapor liberated from the liquid is separately drawn upward and exits compartment 104 through aperture 150 into compartment 105. As stated in Pisecky:

From here the liquid reaches, via an annular duct 164 formed by the guide walls 160 and 161, the part of compartment 104 adjacent to the centre of the atomizer wheel.

\* \* \* \*

From duct 165 the *steam reaches compartment 104 as an annular jet which envelopes the space* which receives the liquid from duct 164.

When the liquid from duct 164 reaches down into the inner part of compartment 104 a strong degasification and steam generation takes place from the liquid while it, under strong turbulence, is accelerated by the sudden contact

with the rotating atomizer wheel. While *the liquid subsequently flows towards the ejection apertures 106*, the gas and steam generated will be rapidly carried away by the flow of steam from duct 165 so that the risk of gas being again taken up into the liquid is significantly reduced.

\* \* \* \*

The flow of *steam which has absorbed the gas and vapour liberated from the liquid is drawn* by suction, due to the fan effect produced by apertures 107, together with entrained droplets of liquid *up into compartment 105 through the annular aperture 150* present between wall 108 and the external guide wall 159.

Pisecky at column 8, lines 30-61. (emphasis added). While Pisecky does not define “envelope,” that term is commonly understood as “enclosing” or an “enclosure” which is the opposite of mixing. See Webster’s Ninth New Collegiate Dictionary and the definitions for “envelop” and “envelope”.

As the above quoted language makes clear, the purpose of Pisecky’s compartment 104 is to allow the steam and gas to be *separated* from the liquid milk product, not “substantially atomizing the product in liquid form by admixing steam in a mixing chamber” as required by Applicant’s claim 25. Pisecky’s supply chamber 104 *performs the opposite function* of the claimed mixing chamber, i.e. separating instead of mixing, and there is no factual evidence identified by the Examiner to the contrary. Pisecky’s supply chamber 104 is not a mixing chamber. It is a separating chamber designed to separate gas and steam from the liquid milk product. In chamber 104, the steam acts as an extracting medium for gas and vapor from the liquid milk. The bulk of the degasified liquid milk leaves compartment 104 in liquid form through a different exit from the steam and gas. This is not what occurs when the claimed method is practiced.

In the claimed method there is “substantially atomizing” of the liquid product in the mixing chamber, i.e., the bulk of the liquid product does not remain in liquid form, it becomes

substantially atomized material in the mixing chamber. Although some entrained droplets of liquid may be withdrawn with the steam and absorbed gas from Pisecky's compartment 104 through aperture 150, Pisecky's disclosure makes it very clear that "substantially atomizing" of the bulk of the liquid milk product does not take place in compartment 104. Rather, in Pisecky, the bulk of the liquid milk product exits compartment 104 through aperture 106 still in liquid form, not as substantially atomized material.

Further, it would not be obvious to redesign Pisecky's spray drying atomizer wheel device to spray steam into compartment 104 such that it is truly mixed with the liquid milk. If they were truly admixed as required with Applicant's claimed invention, the liquid and the steam and gas could no longer leave Pisecky's compartment 104 by separate exits and this would defeat a major purpose of Pisecky's design which degasifies the liquid milk. Additionally it is apparent that the sudden contact of the annular steam jet flow (which envelops the space and allows degasification of the liquid milk to take place in compartment 104 as opposed to mixing the steam and liquid milk) with Pisecky's atomizer wheel is also essential to the functioning of the atomizer wheel. As stated at column 8, lines 51-55, "the flow of steam from [annular] duct 165 is of relevance for ensuring that the requisite temperature is imparted to the liquid just at the critical point where it first comes into contact with the rotating wheel." Redesign of the Pisecky device to allow mixing rather than separation in compartment 104 would adversely affect this function. ***The law is clear.*** When modification of a primary reference in the manner suggested by the Examiner, defeats the purpose of the primary references or otherwise renders it unsuitable for its intended purpose, the modification cannot be made to support a conclusion of obviousness. See MPEP 2143.01 citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

The record evidence suggests that atomization does not occur in compartment 104 and there is no record evidence upon which one of skill would conclude that atomization occurs in compartment 104, although both steam and the liquid are introduced into compartment 104. Instead, Pisecky is crystal clear that atomization takes place using an atomization wheel which is downstream of compartment 104 and that the steam is used to carry away liberated gases and liquid and also heat the liquid. Pisecky is also clear that the steam and liquid are not mixed in compartment 104 but are separated and leave compartment 104 through different exits.

Pisecky makes clear that the *liquid* is accelerated by sudden contact with the rotating atomizer wheel and that the *liquid* is at a requisite temperature at the critical point where *it, i.e. the liquid*, first comes into contact with the rotating wheel. After reading Pisecky, one of skill would understand that the liquid is not atomized in compartment 104 even though the liquid comes into contact with steam. This is plain as Pisecky makes clear that a *liquid* is introduced into compartment 104 and a *liquid* exits compartment 104 *to be atomized by the rotating wheel*. Further, Pisecky makes clear that the purpose of the steam is to carry away liberated gases and steam and to heat the liquid to the requisite temperature at the *critical point* just before the liquid hits the rotating wheel, *and whereupon the liquid is then atomized*. Pisecky describes the steam as performing certain functions unrelated to atomization, and certainly does not describe atomization. The Examiner has presented no evidence that atomization takes place in the compartment 104. Pisecky's plain description teaches just the opposite. This is further supported by common sense as Pisecky uses an atomizer to atomize.

In fact, Pisecky generally teaches at col. 2 line 62 to col. 3 line 13 with respect to the embodiments described that degasification of air from the liquid takes place *and then the liquid*

*is atomized.* Therefore, according to Pisecky, degasification does not mean that atomization of the liquid occurs.

The present invention aims at more effectively obviating the disadvantages mentioned in the foregoing which are due to the air content or air inclusion in the liquid to be spray dried by employing a rotating atomizer wheel and, according to the invention, this is achieved by imparting to the liquid such a temperature, that in the very atomizer wheel, a strong degasification and possibly boiling take place and by the liberated gas being removed prior to atomization.

By operating with such a temperature so that a strong degasification takes place, which generally means a temperature that lies on or close to the boiling point at the existing pressure, it is possible to remove most of the air content of the liquid, however, in order to achieve the desired result it is necessary for this degasification to take place *during the proper introduction of the liquid into the atomizer wheel shortly before the atomization*, as well as that *the gas generated has to be removed prior to the atomization as otherwise the risk exists that the liquid once more takes up air before atomization.* (Emphasis added.)

Since degasification does not atomize the liquid, since liquid is introduced into the atomizer and since the atomizer is the only mechanism described by Pisecky for atomizing the liquid, one of skill would not understand that substantial atomization occurs when the liquid and steam are introduced into compartment 104. The Examiner has presented no evidence to the contrary to contradict the plain teaching of Pisecky.

At page 12 paragraph 9 of the office action, the Examiner states that “Johnston uses an atomizer to atomize the milk, one recognizes that the thorough admixing of milk and steam (page 3, left column, lines 17-22) result in additional atomization of the milk due to the transfer of heat from steam to milk without affecting its physical characteristics (page 3, left column, lines 28-32).” As with Pisecky, Johnston also fails to disclose “substantially atomizing the product in liquid form by admixing steam in a mixing chamber” as recited by claim 25. Johnston clearly discloses that the liquid milk is substantially atomized before even encountering any steam and that the purpose of the steam is to “maintain the interior of the chamber between 250° and 280°

F. for the sterilization of milk products” (page 3, left column, lines 24-26). As Johnston further expressly discloses “steam and *atomized* material become thoroughly admixed during passage through the chamber” (page 3 left column, lines 20-22), rather than product in liquid form and steam being admixed to substantially atomize the liquid product as required by claim 25. As Johnston further states:

The milk or other liquiform material 6 is forced by the pump 9 into the inlet 12 at the top of the sterilizing chamber 13 at substantially 3000 lbs. per square inch pressure through a spray nozzle 14 designed to reduce the liquid material to a *finely atomized mist-like state*.

\* \* \* \*

Consequently the pump acting through the medium of the *nozzle produces a continuous motion of finely atomized material* downwardly through the chamber 13.

(page 2, right column, lines 69-75 and page 3, left column, lines 10-13) (emphasis added). As such, one would not recognize that substantial atomization takes place in Johnston simply by mixing milk in the liquid form with steam. Johnston only discloses mixing already finely atomized material with steam.

The Examiner has previously recognized that each of Badertscher and Faber fails to teach atomizing within a mixing chamber. (See Office Action, dated June 23, 2009 at page 12.) Each of Badertscher and Faber, therefore, fails to remedy the deficiencies of Pisecky.

For at least the foregoing reasons, the combined disclosures of the cited references fail to teach or suggest the step in independent claim 25 of substantially atomizing the product in liquid form by admixing steam in a mixing chamber heated by the steam so as to kill microorganisms and produce a pasteurized or sterilized product. As such, the Examiner has failed to present a prima facie case of obviousness. Accordingly, applicant respectfully requests reconsideration and allowance of claims 25, 27, 29, 32-37, 40, 47-48, and 50-52.



**B. The Remaining References Fail To Render The Claimed Invention Obvious**

The Examiner recognizes that none of the remaining references of Den Hollander, Rubens, Hovmand or Passey, alone or in combination, cure the deficiencies of the references discussed above, as they do not teach atomizing within a mixing chamber.

For at least the foregoing reasons, the combination of cited references fails to present a prima facie case of obviousness. Accordingly, Applicant respectfully requests reconsideration and allowance of claims 26, 30, 31, 38, 41-43, and 49.

New claim 53 depends from claim 25 and is patentable for the same reasons as discussed above. In addition, claim 25 requires introducing steam into the mixing chamber using a spray nozzle. In contrast, Pisecky teaches the use of an annular jet that envelops the space for receiving the liquid. The annular jet is not the spray nozzle. The claimed spray nozzle generates a fine spray that is advantageous for a fast heating of the atomized liquid enabling sterilization or pasteurization of a product with a solids content of at least 53 wt% within about 0.2-20 msec. Pisecky's annular jet admittedly "envelopes" and does not achieve a fine spray for purposes of mixing and sterilizing and is unable to achieve the claimed subject matter.

### III. Conclusion

Having addressed all outstanding issues, Applicant respectfully requests reconsideration and allowance of the present application. To the extent the Examiner believes that it would facilitate allowance of the case, the Examiner is requested to telephone the undersigned at the number below. The Commissioner is hereby authorized to charge any additional fees or credit overpayment to Deposit Account No. 19-0733.

Respectfully submitted,

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